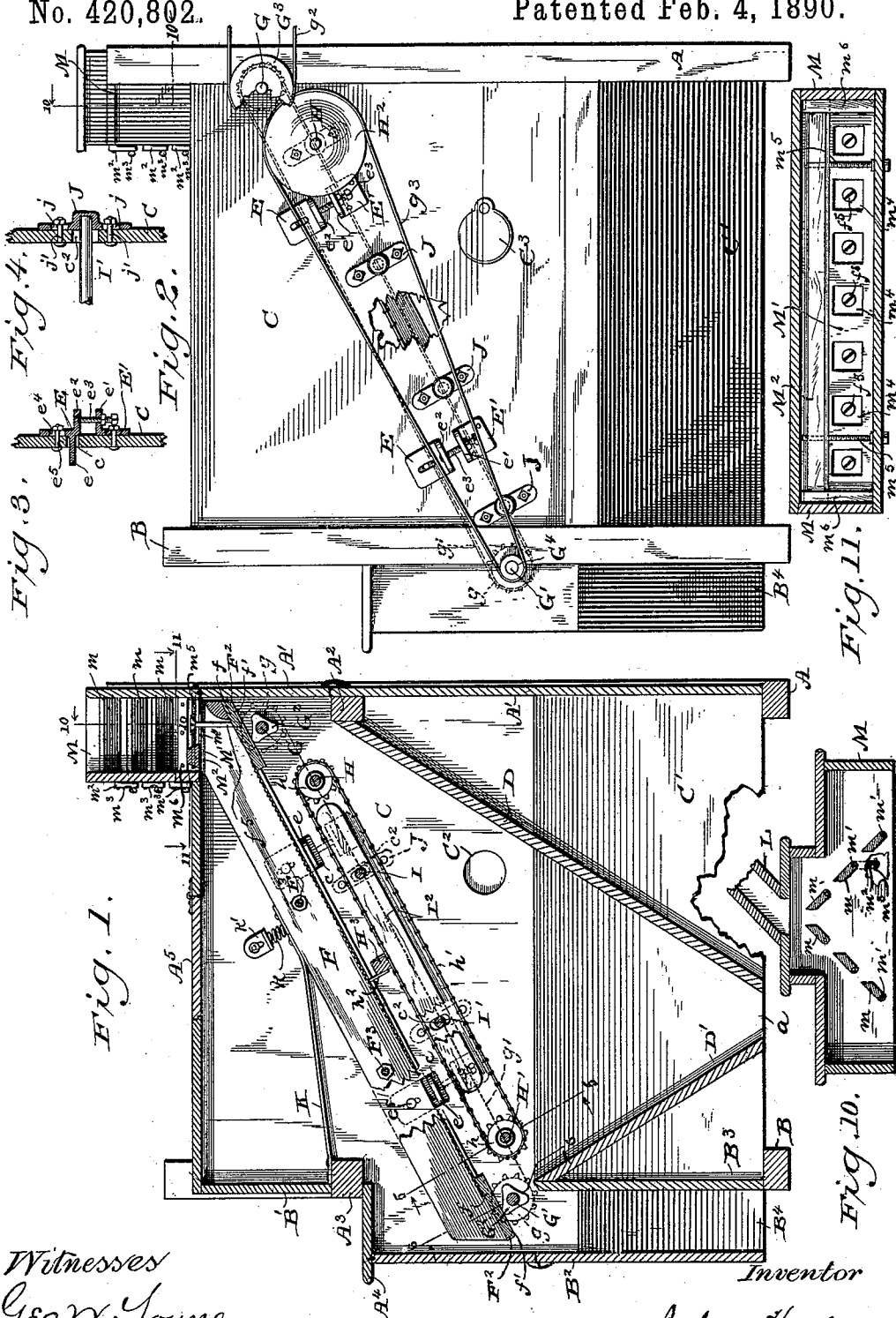


A. HUNTER.
SCALPING AND GRADING DEVICE.

No. 420,802.

Patented Feb. 4, 1890.



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UNITED STATES PATENT OFFICE.

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SCALPING AND GRADING DEVICE.

SPECIFICATION forming part of Letters Patent No. 420,802, dated February 4, 1890.

Application filed December 20, 1887. Serial No. 258,461. (No model.)

To all whom it may concern:

Be it known that I, ANDREW HUNTER, of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Scalping and Grading Devices; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to separating devices for the treatment of breaks and chop as well as grain, of the general description known as "break-scalpers" and "chop and wheat graders," and will be fully described hereinafter, and pointed out in the claims.

In the drawings, Figure 1 is a vertical longitudinal central section through my improved machine; and Fig. 2 is a side elevation of the same, parts being broken away in both views to better illustrate the construction. Figs. 3 to 11, inclusive, are detail views.

A A represent the corner-posts at the head of my machine, and B B like posts at the tail end, A' being the head wall, and B' B² represent the rear walls, the latter being the outer wall of a rear extension beyond the posts B B, there being a partition B³ in line with said posts and with the wall B' above, said partition B³ and wall B² forming with the inclined hopper-boards B⁴ a spout for the tailings.

C C are the side walls, and C' C' are inclined cant-boards projecting inwardly from the lower portions of said side walls.

D D' are other and interior cant-boards arranged at right angles to the cant-boards C' to form, in connection with them, a four-sided hopper with a discharge-opening at *a*, the board D' only extending up as high as the top of the partition B³ and cant-boards C', while the board D extends up to the cross-bar A², which bar extends across the head wall A, as shown.

F is a screen which is supported at an angle of practically twenty-seven degrees (so as to have a rise of six and a quarter inches to the foot, which I find by repeated experiment to be the most desirable) across the inner surface of the machine from side to side, the side pieces of said screen resting upon the inwardly-projecting arms *e* of vertically-adjustable brackets E, (shown in detail in Fig. 3,) which arms *e* project within the machine through slots *c* in the described side walls C of the machine,

and said brackets have upwardly-extending flanges (bearing against the outside of the said walls C) provided with slots *e*⁴, for the reception of set-bolts *e*⁵, and below said slots the said brackets have lateral arms or flanges *e*², which flanges close the described slots *c* in the side walls C against the admission of air.

Below each bracket E is a stationary angle-plate E', rigidly secured to the exterior of the wall C, and the lateral arm or flange *e*' of which plate E' carries an adjusting-screw *e*³, which bears against the under side of the described lateral flange *e*² of the adjacent bracket E, and the said brackets can be raised in adjustment by loosening the bolts *e*⁵ and turning the adjusting-screws *e*³, and thereby the screen F, supported, as stated, on the arms of said brackets, can be adjusted to the required height above the cam-shafts G G', as hereinafter explained.

On the under side of the screen F, at each end, are transverse strips of wood *f*, and near each end of each strip *f* the same is covered on its under side with a piece of leather or other suitable material *f*¹, (such as rawhide or even soft-metal,) which can be renewed or replaced when worn out with but little trouble, as the pieces are located near the corners of the screen-frame. The manner of securing these pieces *f*¹, (which I term "impact-pieces,") is shown in detail in Figs. 8 and 9 and in Fig. 7, (which is a section on the line 7 7 of Figs. 6 and 8.) The impact pieces *f*¹ are oblong in shape, cut away at the corners at one end, as shown at *f*² *f*², leaving a narrow tongue *f*³ between them, and a metal loop F' receives said tongue, the ends *f*⁴ *f*⁴ of said loop fitting against the under side of the wooden strip *f*, where the corners of the leather have been cut away at *f*² *f*², and are secured to said strip by screws. The other end of the piece *f*¹ is clamped to the strip *f* by an angle-plate F², whose vertical flange is secured to the edge of the wooden strip *f* by screws, as shown.

My screen F is strengthened by means of transverse rods or braces F³, extending from one side to the other above the screen at suitable intervals, which are preferably wooden rods, to insure lightness, or else light iron rods having set-nuts, as shown.

Just below the described wooden strips *f* are the transverse shafts G G', (the lower or

rear shaft G being shown in detail in Fig. 6, which is a section on the line 6 6 of Fig. 1,) the ends of which shafts project through the side walls C C and are journaled to the posts A A and B B, respectively, the ends which project through the wall C, opposite to that shown in Fig. 2, carrying sprocket-wheels $g g$, connected by a sprocket-chain g , (shown in dotted lines in Figs. 1 and 2,) and each shaft G G' carries near each end, inside the machine and just under the impact pieces or leather-covered portions f' of the strips f , a cam-wheel G^3 , (having, preferably, three cam-points,) and motion to revolve these shafts G G' and their attachments is communicated from any suitable power by means of pulley G^3 on the other end of the front or upper shaft G and belt g^2 .

H H' are two iron shafts, the rear or lower shaft H' being shown in detail in Fig. 5, (which is a section on the line 5 5 of Fig. 1,) and this shaft passes through slots $c' c'$ in the side walls C C, its ends being journaled in the adjustable boxes J J, which have flanges bearing against the outside of the walls C, said flanges being provided with slots j , through which and the adjacent walls C securing-bolts j' extend, so that by loosening the nuts on said bolts j' the boxes J may be shifted up or down, carrying the shaft H' with them, and the nuts again tightened to place after this adjustment. This shaft H' carries two sprocket-wheels $h h$, situated near the ends thereof within the machine. The upper or front shaft H is similarly journaled, except that one end of said shaft projects through its box and carries on its end the pulley H^2 . This shaft H carries similar sprocket-wheels $h h$ within the machine in line with those on the shaft H', and the corresponding sprocket-wheels on each shaft are united by sprocket-chains h' , which chains are connected together by a transverse bar H^3 , secured to the chains, and from one edge of said bar there rises the scraper or brush h^2 . (Shown as a leather scraper, but which may be a wire or bristle brush, if desired, or of any preferred material.)

The object of making the boxes J adjustable is to enable the sprocket-chains, which carry the brush or scraper, to be moved nearer to or farther from the underside of the screen F, as found necessary in any given case or at any time.

Intermediate between the boxes J J described the side walls C C are provided with other slots $c^2 c^2$, for the passage therethrough of wooden rods I I', whose ends rest in adjustable boxes J J, identical with those described for the ends of the shaft H', as shown in detail in Fig. 4, and these rods are united by a pair of longitudinal wooden strips $I^2 I^2$, which serve as guides or supports for the brush or scraper bar H^3 , moving thereover, as shown in Fig. 5, and the boxes J J of these rods $I^2 I^2$ are made adjustable for the same

reason that the boxes of the shafts H H' are so made.

K, Fig. 1, represents an elastic strip, of wood or metal, extending from a beam A^3 at the tail end of the machine to about the center of the screen, and there connected to the side piece of the screen F, as shown. There are two of these elastic strips K—one connected to each side piece of the screen to prevent any end movement of said screen, and to keep it always square, and to prevent any jumping motion of the screen springs k are provided, resting on the upper edge of each side piece of said screen, the upper ends of said springs bearing against brackets k' , which latter are made adjustable by slot and set-screw, as shown.

L, Fig. 10, (which figure is a section on the line 10 10 of Figs. 1 and 2,) represents the feed-pipe of the hopper, which leads to the casing M, extending across the head end of the machine, and within this casing are located series of dividing and guiding strips $m m$, rising from shafts m' , which strips are set at such an angle that the material fed through the spout L will flow easily over them, while, whenever desired, the angle of any of said strips m may be changed by turning the handles m^2 on the outer projecting ends of their supporting-shafts, and fastening said handles, by turning their set-screws m^3 against the outside of the casing M, (or into holes formed in the outside of said casing,) so as to cause said material to fall between said strips m at such points in its downward passage.

The casing M has a metal bottom M' , provided with a series of openings m^4 , which may be partially closed by drawing the cut-off bar M^2 more or less across them, said bar having transverse screw-threads formed therein, which receive adjusting-screws m^5 , and by turning the heads of which the said bar will approach or recede from the front of the casing, thereby closing or uncovering the said openings m^4 , there being transverse strips m^6 across the side walls of the casing M, to prevent the bar M^2 from rising, and through the said openings m^4 there extend screws or pins f^5 , rising from the head end of the screen F, to serve as agitators and stir up the material in the casing M, all as clearly shown in Fig. 1 and in the detail view, Fig. 11, which is a section taken on the line 11 11 of Fig. 1.

For convenience in obtaining access to the screen F, as in replacing the worn-out leather impact pieces described, or for oiling or cleaning or in removing said screen, the head wall A' may be made in sections, so as to have a removable portion extending from just above the beam A^2 to just below the casing M, and similarly the rear wall B^2 may have a like removable portion extending from, say, about the line of the top of the partition B^3 up to the horizontal board A^4 , which connects the beam A^2 with said wall B^2 , and these removable pieces may be held in place

in any ordinary manner, as by means of the pins and buttons shown. I show a hinged door A⁵ on the top of my machine, as well as hand-holes C² in the side walls C, closed by covers C³, all of ordinary construction.

The operation of my device is as follows: Power being applied to the shaft G and the parts being arranged as shown in Fig. 1, the material to be operated upon is fed through the spout L into the casing M, whence it falls over and between the dividing and guiding strips *m*, as hereinbefore described, onto the head end of the screen F, which, by reason of its being set at the described angle, has an inclination almost sufficient for the material to run off by its own gravity, and then by the impacts of the cam-wheels against the leather-covered pieces on the under side of the said screen the said material is caused to travel rapidly downward, while at the same time, by reason of said impacts, the finer portions are precipitated and forced through the meshes of the screen, falling into the described four-sided hopper and out at *a*, while their tailings fall over the tail end of the screen into the described spout prepared for their reception, and the said impacts tend to prevent clogging of the screen-meshes. In the event of said meshes becoming clogged from any cause, (such as a change in the weather, or in the condition of the material,) my hereinbefore-described scraper or brush is brought into use, which may be automatic, by simply connecting the pulley H² on shaft H with a pulley G⁴ on the end of shaft G' by belt *g*³, as shown in Fig. 2, or if there is only an occasional clogging this belt *g*³ need not be used, and a crank may be fitted to the end of said shaft H and the brush or scraper operated a few times by hand whenever required.

While my preferred angle of inclination for the screen F is, as stated, practically twenty-seven degrees for most material which would be treated in said machine, certain material may require a slight variation from this angle, and my screen, if set at an angle of about twenty degrees, will do the work but slowly—that is, will scalp the breaks for a hundred-barrel mill in one day—whereas if set at twenty-seven degrees, with the same material, it will scalp five times as much in the same time, the best effects being obtained when the screen is set at such an angle as will

hold the material (whatever it may be) on it just at the point of moving by its own gravity, yet requiring impacts to set it in motion.

By substituting silk bolting-cloth for wire in the screen my device may be adapted for bolting flour.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a scalping and grading device, the combination, with an inclined screen, of adjustable brackets for supporting the screen-frame, a pair of elastic strips extending from the frame of the machine to about the center of the screen-frame and secured to the side pieces thereof, impact pieces on the lower side of the screen-frame, at or near the corners thereof, transverse shafts located beneath said screen, and cam-wheels adapted for contacts or impacts with the corners of the screen-frame.

2. In a scalping or grading device, the combination of an inclined screen having impact pieces at the corners of the under side of its frame, with adjustable brackets for supporting the screen-frame, transverse shafts located beneath the screen, and bearing cam-wheels adapted for impacts against the said corners of the screen-frame, and a scraping device secured to sprocket-chains traveling over sprocket-wheels on transverse shafts located between the said cam-shafts and scraping the under side of the said inclined screen.

3. In a scalping and grading device, the combination, with an inclined screen and hopper or feed-spout, of an intermediate casing having a perforated bottom, a series of adjustable dividing and guiding strips rising from pivoted shafts, locking devices on said shafts, a series of agitating-pins rising from the screen and projecting through the perforations in the bottom of the casing, and a cut-off bar provided with adjusting-screws to vary the size of the said openings in the bottom of the said casing.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

ANDREW HUNTER.

Witnesses:

H. G. UNDERWOOD,
WILLIAM KLUG.